

KUCHARSKI, Jozef Kazimiers; SZYSZKO, Bzena; MARDAROWICZ, Czeslaw

A case of laboratory tetanus. Polski tygod.lek.15 no.7:263-265
15 F '60.

1. Z Kliniki Chorob Zakaźnych A.M. w Lublinie; kierownik: dr.med.
J.K. Kucharski i z Katedry Mikrobiologii Lekarskiej A.M. w Lubli-
nie; kierownik: prof.dr. Jozef Parnas.

(TETANUS case reports)

KUCHARSKI, K.

Economic incentives and their consequences. Przegl techn
84 no.40:5 6 0 '63.

KUCHARSKI, Kazimierz, inz.

Cast forging dies. Wiad hutn 13 no.6:180-181 Je '62.

KUCHARSKI, Kazimierz, inz.

Durability of thin piston rods of steam-air hammers.
Wied hut 18 no.7/8:221-223 J1-Ag '62.

KUCHARSKI, Kazimierz, inż.

Export production of locomotive turnouts. Przegl techn no.6:
5 10 F '63.

1. Huta im. K. Swierczewskiego, Zawadzkie.

KUCHARSKI, Kazimierz, inz.

How to increase the number of regenerations in forging
dies. Wiad hut 19 no.1:24-25 Ja '63.

KUCHARSKI, Kazimierz, inż.

Iron casting industry in Opole Province. Przegl techn
no.25:8. Je '62.

WUSATOWSKI, Zygmunt; KRAWCZYK, Ryszard; KUCHARSKI, Kazimierz

High draught hot rolling of M St 7 steel. Metal i odlew
no.7:161-205 '61.

1. Politechnika Slaska, Gliwice.

KUCHARSKI, Kazimierz, mgr inż.

The die card. Wlad hut 19 no.12:359-361 D'63.

L 45851-66 EWP(j)/T IJP(a) WW/RM
ACC NR: AP6029091 (4) SOURCE CODE: GE/0004/66/000/006/0330/0332

AUTHOR: Rabek, T. I.; Kucharski, M.; Skowronski, T.; Wojaczynska, Maria;
Zuchowska, Danuta

ORG: Institute of Chemistry of Plastics and Technology, Polytechnic Institute,
Wroclaw (Institut fur Chemie und Technologie der Plaste der Technischen
Hochschule)

TITLE: Copolymerization of butadiene with styrene to products of low molecular weight

30
B

SOURCE: Plaste und Kautschuk, v. 13, no. 6, 1966, 330-332

TOPIC TAGS: mixed polymerization, butadiene, oligomer, polymer cross linking

ABSTRACT: The following optimum conditions are suggested for the polymerization of butadiene with styrene (with the composition given in parts by weight): 75 butadiene, 25 styrene, 5 sodium, 100 benzene, 30 dioxane, 0.2 sodium isopropylate. Polymerization temperature ranges from 60 to 70C; the reaction time is 8 hr.; molecular weight of the copolymer is 307 and the temperature jump at cross-linking is 20C. The copolymer yield is a function of temperature; it is lower

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L 45851-66

ACC NR: AP6029091

between 50 and 70C in an inert solvent than at temperatures above 70C. The addition of ether and dioxane results in higher styrene quantity in the copolymer. The effect is higher with dioxane (18 to 27%) than with ether (14 to 16%). The increase of ether and dioxane from 10 to 50 (pt. wt.) lowers the molecular weight. The cross-linking capacity of the copolymer is independent of the amount of styrene in it (within the range from 20 to 28%) and of the molecular weight, although it depends on the share of 1, 2-structure in the copolymer. The content of the 1, 2-structure is markedly affected by dioxane during copolymerization. The optimum cross-linking parameters are: a 120C temperature, and a 1-hr reaction time followed by heating at 150C for 5 hr. The product obtained represents a cross-linked polymer, insoluble in organic solvents and nonexpandable. Orig. art. has: 10 figures and 3 tables. [Based on author's abstract] [DR]

SUB CODE: 07, 11/ SUBM DATE: 08Jun65/ SOV REF: 003/ OTH REF: 010/

Card 2/2 JS

SIKIERSKI, Slawomir; KUCHARSKI, Marian

Coprecipitation of phosphates and sulfates with hydroxides. Rocz
chemii 34 no.5:1265-1274 '60. (EEAI 10:9)

1. Radiochemical Laboratory, Institute of Nuclear Research, Warszawa.

(Precipitation(Chemistry)) (Phosphates)
(Sulfates) (Hydroxides)

0/0025/64/000/001/0038/0040

ACCESSION NR: AP4038571

AUTHOR: Plejewski, R.; Kucharski, M.

TITLE: New method for producing carrier-free H sub 2 S sup 35 O sub 4 on a production scale

SOURCE: Kernenergic, no. 1, 1964, 38-40

TOPIC TAGS: radioisotope, production, H sub 2 S sup 35 O sub 4, carrier-free, separation, neutron, radiation, reactor, KCl.

ABSTRACT: S^{35} is obtained by neutron irradiation of KCl in a reactor. Two chromatographic columns are used to separate S^{35} from the irradiated target. The first is charged with Al_2O_3 and serves to separate sulfur from P^{32} , Cl^{36} , Cl^{38} , K^{42} , and the main portion of KCl. The second one is charged with a cation exchanger in H-form to separate sulfur from all cationic impurities including K^+ -residues, and assures the presence of sulfur as H_2SO_4 . The column parameters are selected so that a single application of the two columns suffices. Carrier-free, S^{35} -tagged H_2SO_4 in $10^{-2} - 10^{-3}$ n HCl is obtained of purity greater than 99%. The specific activity is 35 mc/ml, and the pH is 2-3. The radioisotope may be used for medical

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ACCESSION NR: AP4038571

purposes. "The authors thank S. Lisicki for his valuable support during the experimental work." Original article has: 3 figures and 2 tables.

ASSOCIATION: Institut fuer Kernforschung, Warsaw (Institute for Nuclear Research)

SUBMITTED: 11Apr63

DATE ACQ: 10Jun64

ENCL: 00

SUB CODE: NP, GC

NO REF SOV: 002

OTHER: 012

Card 2/2

S/081/62/000/001/038/067
B168/B101

AUTHORS: Kucharski, M., Plojewski, R.

TITLE: A method of producing carrier-free sulfur S^{35} in the form of $H_2S^{35}O_4$

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 1, 1962, 329, abstract 1K5 ([Referat.] Inst. badan jadrow. PAN, no. 192/XIII, 1960)

TEXT: Radioactive S^{35} is produced on a commercial scale in the form of H_2SO_4 . In this case the H_2SO_4 is obtained without carrier by irradiation of a KCl target with a neutron flux (10^{13} neutr/cm².sec) for a period of four weeks. The main product is obtained from the reaction $Cl^{35}(n,p)S^{35}$. In addition to S^{35} irradiation produces K^{42} , P^{32} , Cl^{36} , and Cl^{38} ; of these the sulfur and phosphorus immediately oxidize and take the form of ions PO_4^{3-} and SO_4^{2-} , whilst the K^{42} and Cl^{38} , which have a very short half-life, virtually disappear. After the irradiated target has been

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A method of producing...

S/081/62/000/001/038/067
B168/B101

dissolved, the PO_4^{3-} is precipitated with $\text{Fe}(\text{OH})_3$ whilst the potassium ions are removed by passing the solution through an ion-exchange column. The chlorine is removed by distillation under reduced pressure, and the organic impurities are oxidized by the addition of $3\% \text{H}_2\text{O}_2$. Thanks to its chemical and radiochemical purity the S^{35} can be used for medical purposes and for the synthesis of labelled products. The technology of $\text{H}_2\text{S}^{35}\text{O}_4$ production is described. 12 references. [Abstracter's note: Complete translation.]

Card 2/2

MYSAKOWSKA, Helena; ZALUSKA, Stanislaw; GRODZKI, Stanislaw; KUCHARSKI,
Ryszard, PIETRON, Eugeniusz

Clinical forms of pulmonary tuberculosis in women and men from
rural and urban environments. Gruslica 27 no.11:1153-1163 N '59.

I. Z Kliniki Gruslicy Pluc A.M. w Lublinie. Kierownik: doc.dr.
H. Mysakowska.

(TUBERCULOSIS PULMONARY epidemiol.)

KWIEKOWA, Agnieszka; LYPACZENWSKA, Joanna; KUCHARSKI, Ryssard; KUCHTA, Jan;
KWIT, Wladyslaw; ROPEK, Mieczyslaw

Considerations on the work of anti-tuberculosis dispensaries according to the analysis of records of patients under observation no less than 4 years. Gruzlica 27 no.11:1165-1172 N '59.

1. Z Poradni Przeciwgruzliczych: Instytutu Grzulicy w Warszawie, Wojewodskiej Centralnej w Lublinie, Miejskiej w Walbrzychu i Powiatowej w Chrzanowie.

(TUBERCULOSIS hosp.& clinics)

KWIT, Wladyslaw; STASIAK, Eugeniusz; MICH, Jan; KUCHARSKI, Ryszard

Control of human and cattle tuberculosis in the Lublin Region.
Gruzlica 31 no.6:735-738 Je'63

1. Wojewodzka Poradnia Przeciwgruzlica, Lublin.

*

KUCHARSKI, Ryszard

Generalized melanoma in a patient with pulmonary tuberculosis.
Gruslica 28 no.12:1011-1017 D '60.

1. Z Kliniki Pysjatricznej A.M. w Lublinie, Kierownik: doc.
dr H. Mysakowska.

(TUBERCULOSIS PULMONARY compl)

(MELANOMA compl)

KUCHARSKI, Slawoj

Pharmacodynamic studies in the Azerbaijan S.S.R. on the influence of solutions of active bodies and certain preparations obtained from various parts of the fig tree on the cardiac and vascular system. *Farmacja Pol* 20 no. 1/2:1-13 25 Ja'64.

KUCHARSKI, Slawoj, st. asystent

In the thousand-tower city; remembrances of a fellowship
holder of the Ministry of Health from his stay in Azerbaijan.
Farmacja Pol 20 no. 3/4:119-124 25 F '64.

1. Akademia Medyczna, Poznan.

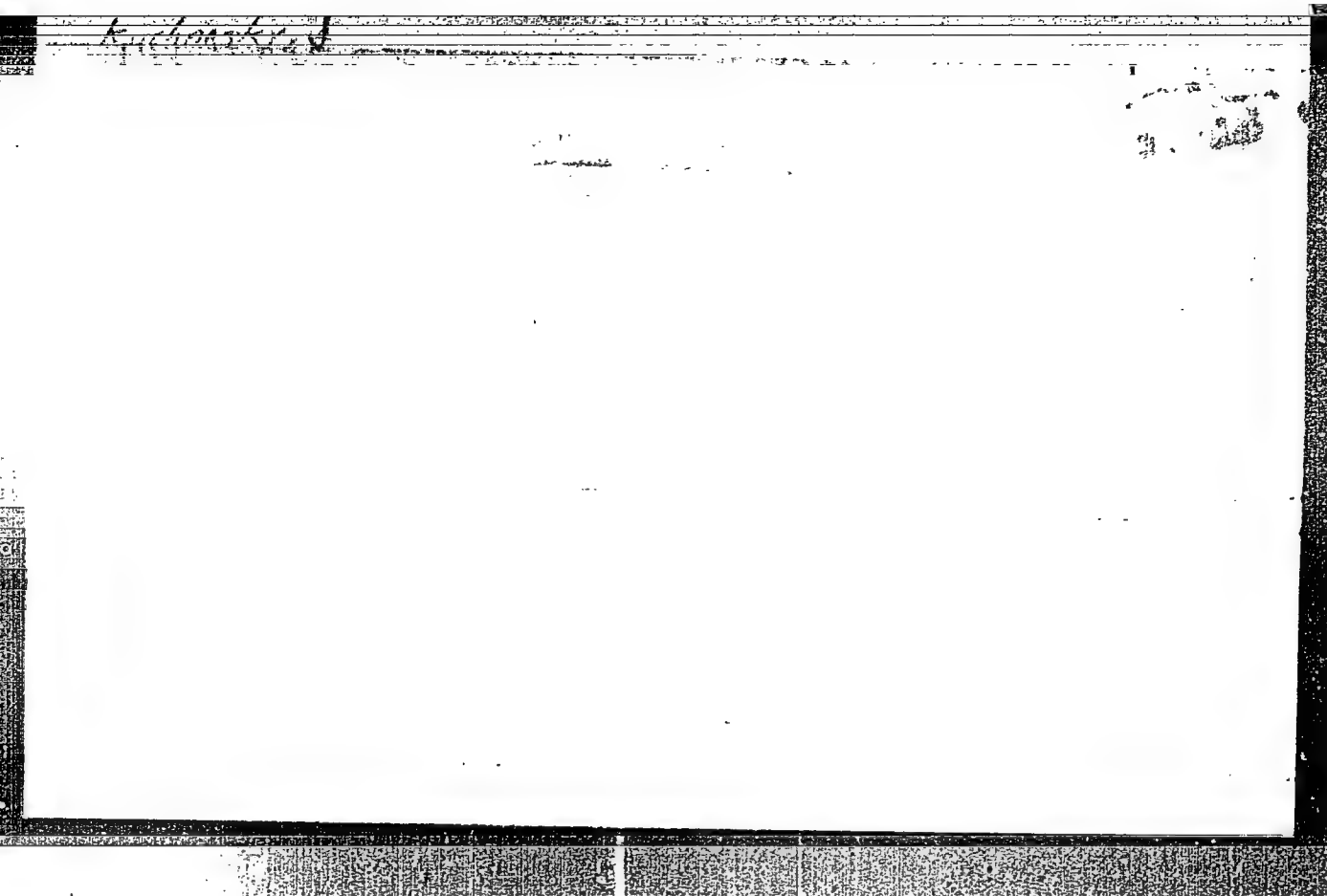
BCS KUCHARSKY J.

*Apparatus & Methods
of Testing*

372. Use of complements in chemical analysis. VIII. The gravimetric estimation of beryllium.—R. PARR and J. KUCHARSKY (Coll. Czech. Chem. Commun., 18, 172, 1953). The influence of NH_4OH on the complex cpds. formed by ethylenediamine tetra-acetic acid with various metals was examined. The complex presumed to be formed between this acid and Be is so unstable that $\text{Be}(\text{OH})_2$ may be quantitatively pptd. from it with NH_4OH . A method of analysis based on this observation is applicable to the analysis of silicates containing Be. (17 tables.)

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APPROVED FOR RELEASE: 03/13/2001

CIA-RDP86-00513R000827030002-9"

KUCHARSKY, Z.

TECHNOLOGY

Periodical: POZEMNI STAVBY. Vol. 6, no. 10, Oct. 1958.

KUCHARSKY, Z.; SKUTA, R. Prefabrication of sanitary installations of the T 16 type in plants assembling structural elements. p. 601.

Monthly List of East European Accession (EEAI) LC, Vol. 8, no. 3
March 1959 Unclass.

KUCHARZ, J.

The influence of state farms on individual farms, p. 856.

NOWE ROLNICTWO. (Panstwowe Wydawnictwo Rolnicze i Lesne) Warszawa, Poland.
Vol. 8, no. 23, Dec. 1959.

Monthly list of East European Accessions (EFAI) LC, Vol. 9, no. 2, Feb. 1960

Uncl.

KUCHARZEWski, Bohdan

A spectrographic method of analyzing metallic tungsten. Chem anal 7 no.2:
349-354 '62

1. Zakład Chemii Analitycznej, Instytut Badan Jadrowych, Polska Akademia Nauk, Warszawa. Kierownik Zakladu: prof. dr. J. Minczewski.

Kucharczyk, M

Kucharczyk, M. Die Differenzierbarkeit der homogenen Funktionen und die geometrischen Eigenschaften der Indicatrix von Carathéodory. Ann. Polon. Math. 1 (1955), 222-252.

A positive homogeneous function $f(x)$ (with x in R_n) has under certain conditions (e.g., if $f(x)$ is continuous) an indicatrix I in R_n defined as the sets of points for which $f(x)=1$. The author shows, after some discussion of contingents and tangency in R_n , that in general the existence of a derivative for $f(x)$ at a point is equivalent to the existence of an n -dimensional tangent plane (not containing the origin) to I at the corresponding point.

U. S. Haslam-Jones (Oxford)

1 - F/7

2
6
1

Don

KUCHARZEWski, M.

Generalization of the Euler equation for homogeneous functions. In German. p.326
ANNALS POLONICI MATHEMATICI (Polska Akademia Nauk) Warszawa.
Vol. 1, no. 2, 1955

So. East European Accessions Vol. 5, No. 2 September 1956

UATZAK: M

308

✓ Golab, S.; und Kucharzewski, M. Zur Theorie der geometrischen Objekte. Ann. Polon. Math. 2 (1955), 250-253 (1956).

The author considers certain algebraic combinations of geometric objects and determines whether these combinations are themselves geometric objects. Let Γ_{μ}^{λ} be an affine connection, $\Gamma_{\mu}^{\lambda} = \Gamma_{\mu}^{\lambda}$, and $A_{\mu}^{\lambda} = \partial \Gamma_{\mu}^{\lambda} / \partial x^{\mu}$. If T_{μ}^{λ} is an affinor-density, the combination $T_{\mu}^{\lambda} \Gamma_{\mu}^{\lambda}$ is not necessarily a geometric object. However, if $p=q$ and $T_{\mu}^{\lambda} = A_{\mu}^{\lambda} \dots A_{\mu}^{\lambda}$, the above combination is a geometric object. When $p=1$, we obtain $A_{\mu}^{\lambda} \Gamma_{\mu}^{\lambda} = A_{\mu}^{\lambda}$, which conceivably can be used to define the parallel displacement of a vector. This works for $n > 1$ if and only if the underlying group of coordinate transformations is restricted to the affine subgroup. For $n=1$, A_{μ}^{λ} defines parallel displacement without this restriction.

C. B. Allendoerfer (Seattle, Wash.)

2

1 - F/W

POW

for

GOLAB, S. (Krakow); KUCHARZEWSKI, M. (Katowice)

On the notion of gradient. II. A certain extremal property of direction
of the gradient vector. Annales pol math 8 no.1:5-12 '60. (EBAI 10:2)
(Vector analysis)

GOLAB, S. (Krakow); KUCHARZEWSKI, M. (Katowice)

Remark about the theory of comitants. Acta mat Hung 11 no.1/2:
173-174 '60. (EEAI 9:12)

1. Vorgelegt von G.Hajos.
 (Numbers, Theory of)
 (Calculus of tensors)

KUCHARZEWSKI, M. (Katowice)

On vector oomitants in vector fields. In German. Annales pol
math 9 no.3:299-309 '61. (EEAI 10:8)
(Geometry) (Vector analysis)

KUCHARZEWSKI, M. (Katowice)

On scalar comitants in vector fields. In German. Annales pol
math 9 no.3:311-323 '61. (KEAI 10:8)
(Geometry) (Vector analysis)

KUCHARZEWSKI, M. (Katowice); KUCZMA, M. (Krakow)

On the functional equation $F(A \cdot B) = F(A) \cdot F(B)$
Annales Pol math 13 no.1:1-17 '63.

KUCHARZEWSKI, M. (Katowice)

Concept of the comitant. Annales Pol math 13 no.2:115-120
'63.

KUCHARZEWSKI, M. (Katowice); KUCZMA, M. (Krakow)

Determination of geometric objects of the type $[2,2,1]$ with a linear homogeneous transformation formula. Annales Pol math 14 no. 1:29-48 '63.

On a system of functional equations occurring in the theory of geometric objects. Ibid.:59-67.

GOLAB, S. (Krakow); JAKUBOWICZ, A. (Szczecin); KUCHARZEWSKI, M. (Katowice);
KUCZMA, M. (Katowice)

The geometric object representing a direction makes sense.
Annales Pol math 15 no.3:233-236 '64.

KUCHARZEWSKI, M. (Katowice); KUCZMA, M. (Krakow).

Determination of linear differential geometric objects of the first class, with two components, in a two-dimensional space. Annales Pol math 40 no. 1:77-84, '64.

KUCHARZENSKI, M.; KUCZMA, M.

Basic concepts of the theory of geometric objects. *Rozprawy
matemat* 43:1-72 '64.

26612

P/032/60/007/003/002/002
D259/D301

10 1300
AUTHORS:

Prosnak, Włodzimierz, J., and Kucharzyk, Piotr
(Warsaw)

TITLE:

On a profile with blowing aileron or flap

PERIODICAL:

Archiwum budowy maszyn, v. 7, no. 3, 1960, 313 - 333

TEXT: This article was delivered by P. Kucharczyk at the 1959, September 7 - 13 conference on the Zakład Mechaniki Cieczy i Gazow IPPT - PAN (PAS - IPPT Section of the Mechanics of Liquids and Gases), in Augustow. The purpose of the authors' work was to examine the aerodynamic properties of profiles with blowing ailerons or flaps. Experiments carried out by the Katedra aerodynamiki politechniki Warszawskiej (Aerodynamics Department of the Warsaw Polytechnic) on the flow around the airfoil with a jet flap only in the central section of the span, shows that an increase of the angle of attack appears also at the end section of the airfoil not directly affected by the jet. The effect of the jet preventing the separation of the boundary layers is ev-

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D259/D301

On a profile with blowing...

ident only in the central section under the direct influence of the jet. It was further established that with a blowing jet, the separation of the boundary layers from the airfoil end sections occurs at smaller angles of attack than without the help of the jet. For their treatment of the problem, the authors assumed a steady flow of an ideal fluid. The airfoil profile and the airfoil, as well as the mechanical flap, were represented by rectilinear sections and the jet sheet in the trailing edge of the airfoil profile by a jet source on the profile proper. On the basis of these ideal conditions, the authors derived the formulas for the lift, momentum and drag coefficients through mathematical treatment, based to some extent on the conformal representations given by J. Bonder, on the magnitudes for circular flow governed by Zukowski's condition [Abstracter's note: Condition not defined] and on the Blasius-Czaplygin [Abstracter's note: Not defined] equations. The lift is expressed by the formula

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On a profile with blowing...

$$c_y = f_1(\alpha, \beta, \sigma_1, \sigma_2, \sigma_3) + f_2(c_j, \alpha, \beta, \sigma_1, \sigma_2, \sigma_3) \quad (48)$$

and the drag by formula

(44)

$$c_x = -c_j$$

where α is the angle of attack; β , the flap angle; c_j , the flow coefficient, σ_1, σ_2 , and σ_3 , the geometrical parameters. The functions f_1 and f_2 are defined parametrically by mathematical calculation. There are 6 figures and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: W. Prosnak and P. Kucharczyk: The Influence of the Ground on the Aerodynamic Properties of an Airfoil with Jet Flap, "Archiwum Mechaniki Stosowanej", PWN, Warsaw 1959, vol. 11, no. 4 (475 - 509) and W. Prosnak: Theory of Two-Dimensional Aerofoil with Jet Flap, "Archiwum Mechaniki Stosowanej", PWN, Warsaw 1958, vo. 10, no. X

Card 3/4

On a profile with blowing...

P/032/60/007/003/002/002
D259/D301

X

1 (3 - 24).

ASSOCIATION: Katedra aerodynamiki politechniki Warszawskiej
(Aerodynamics Department of the Warsaw Polytechnic Institute)

SUBMITTED: February, 1960

Card 4/4

KUCHAVA, A.A.

Isolated pericardial wound. Khirurgiia no.10:80-81 0 '53. (MLRA 6:11)

1. Iz fakul'tetskoy khirurgicheskoy kliniki (direktor - professor A.A.Kozyrev)
Kubanskogo meditsinskogo instituta. (Pericardium--Wounds and injuries)

MOSIDZE, V.M.; KUCHAVA, M.A.

Paired and separate work of the cerebral cortex in dogs. Soob.AN
Gruz.SSR 28 no.1:89-96 Ja '62. (MJRA 15:4)

1. Akademiya nauk Gruzinskoy SSR, Institut fiziologii, Tbilisi.
Predstavleno akademikom I.S.Beritashvili.
(CEREBRAL CORTEX)

BAGDAVADZE, N.V.; BARBAKADZE, L.V.; GINTURI, E.N.; KUCHAVA, N.Ye.;
MOSULISHVILI, L.M.; KHARABADZE, N.Ye.

Radioactivation method for determining gold in the blood. Soob.
AN Gruz. SSR 39 no.2:287-294 Ag '65. (MIRA 18:9)

1. Institut fiziki AN GruzSSR. Submitted January 15, 1965.

BERDZENISHVILI, B.G.; VAYNSHTEYN, B.Z.; ZHITKOV, N.Ya.; KUCHAVA, V.A.

Lightened pantograph for high-speed rolling stock. Elek. i
tepl. tiaga 7 no.3:6-7 Mr '63. (MIRA 16:6)

1. Sotrudniki otdela elektricheskoy tyagi Nauchno-issledovatel'-
skogo elektrotekhnicheskogo instituta Soveta narodnogo
khozyaystva Gruzinskoy SSR.
(Electric railroads--Wires and wiring)

KUCHAY, L. N.

9

PHASE I BOOK EXPLOITATION

SOV/6030

Samsonov, G. V., Corresponding Member, Academy of Sciences UkrSSR;
A. T. Pilipenko, Doctor of Chemical Sciences, Professor; T. N.
Nazarchuk, Candidate of Chemical Sciences; O. I. Popova, Candi-
date of Chemical Sciences; and T. Ya. Kosoladova, V. A. Obolon-
chik, G. Kh. Kotlyar, L. N. Kuchay, V. P. Kopylova, G. T. Kaban-
nik, A. Kh. Klibus, K. D. Modylevskaya, and S. V. Radzikovskaya.

Analiz tugoplavkikh soedineniy (Analysis of Refractory Compounds)
Moscow, Metallurgizdat, 1962. 256 p. 3250 copies printed.

Ed.: Ye. A. Nikitina; Ed. of Publishing House: O. M. Kamayeva;
Tech. Ed.: A. I. Karasev.

PURPOSE: This book is intended as a laboratory manual for personnel
in plant laboratories of the machinery, chemical, and aircraft
industries and scientific research institutes. It can also be
used by chemistry students at universities and schools of higher
education.

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Analysis of Refractory (Cont.)

SOV/6030

COVERAGE: The book contains data from the literature and from laboratory research on the chemical and mechanical properties, crystalline structure, chemical analysis, production, and industrial and other applications of silicon carbide and other refractory compounds. Methods of determining the basic components of refractory compounds (carbon, boron, nitrogen, and silicon) are reviewed and detailed methods for the chemical analysis of all presently known refractory compounds given. The authors are associated with the Institut metallokeramiki i spetsial'nykh splavov, AN SSSR (Institute of Powder Metallurgy and Special Alloys, Academy of Sciences USSR). No personalities are mentioned. There are 327 references: 175 Soviet and the remainder mainly English and German.

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Appendix: [Water Vapor Pressure (mm Hg) at 15 to
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References

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AVAILABLE: , Library of Congress

SUBJECT: Metals and Metallurgy

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EN/pw/dmc
10-30-62

1194. *N. KUCHAY* The Nature of Narrow Atmospheric Showers by S. A. Kuchay and I. L. Rosenthal *Doklady Akad. Nauk SSSR* 60 1523-1526 (1948) June 21 (In Russian)

Narrow showers were studied at 3860 m altitude with the double telescope described by Zetsepia and ²idus (*Zhur Khantl i Teoret. Fiz.* 17 937 (1947)) with a hodoscopic instrument recording the number of individual counters released during a coincidence above and below a filter. The curve obtained by the first method showed a maximum at a point corresponding to a 2 cm Pb filter; this proved the presence of light particles, probably photons, in the narrow showers studied. This interpretation was corroborated by the comparison of the absorptions in different materials, as well as by the observations made by using the hodoscopic method. In the case of a shower composed of heavy particles, an equal number of counters would be traversed above and below the 2 cm Pb filter; the actual experiments showed that only 20% of the showers were of this kind, i.e., neither absorbed nor multiplied. The general conclusion is that the narrow showers investigated consisted of light particles, presumably photons, generated

400-566 METALLURGICAL LITERATURE CLASSIFICATION
 PHYS. INTEL. *in F. H. J. de la...* AS, US, R

by some process of a non-cascade character.

X

<p><i>N KUCHAY, S. A.</i></p>		<p>8</p>	
<p>1197. Penetrating Particles in Extensive Atmospheric Showers by G T Zatspin, S. A. Kuchay and I L Rosenthal <u>Doklady Akad Nauk SSSR</u> 61 47-49 (1948) July 1 (In Russian) (See also Nuclear Science Abstract No. 1-1564)</p>			
<p>The nature of the penetrating particles in the extensive showers was investigated at 3660 m altitude. The absorption follows an exponential law up to 24 cm Pb, then ceases. The particles which pass through thicker filters are probably mesons observed by Daubin (<u>Ann Chim (Paris)</u> 18 145 and 217 (1943)) or protons. Particles passing through 16 cm Pb were identified as high energy electrons. By applying Selez'kii's theory of the passage of showers through heavy elements, the energy of the electrons in question is found to exceed 1.5×10^{10} ev. These considerations point to the existence of a cause of scattering in showers other than the Coulomb interaction. The estimation of the density of the meson stream gave the value 150-200 particles per m². This high density proves a genetic relationship between the extensive meson showers and the large cascade showers.</p>			
<p>ASD-5L-6 METALLURGICAL LITERATURE CLASSIFICATION</p>		<p><i>Chap. Inst. im P. N. Lebedev, AS-055R</i></p>	
<p>SEARCHED BY</p>		<p>INDEXED BY</p>	
<p>SERIALIZED BY</p>		<p>FILED BY</p>	
<p>DATE</p>		<p>DATE</p>	

W. H. H. D.

120-4-19/35

AUTHORS: Rodin, A.M. and Kuchay, S.A.

TITLE: Measurements of the Depth of Penetration and the Coefficient of Diffusion of a Gas in a Metal (Izmereniye glubiny proniknoveniya i koeffitsiyenta diffuzii gaza v metalle)

PERIODICAL: Priory i Tekhnika Eksperimenta, 1957, No.4, pp. 68 - 69 (USSR).

ABSTRACT: The surface layer of a metal disc can be saturated with any gas by positive ion bombardment in gas discharges, or devices similar to a mass-spectrometer (Ref. 1-5). It is of interest to determine the depth of penetration L of the gas into the body of the metal and also the coefficient of diffusion D of the given gas in the metal. The one-dimensional diffusion equation is solved assuming that the coefficient of diffusion does not depend on the co-ordinates and the gas concentration, and subject to simple boundary conditions. The above assumption applies in a number of cases (Le Claire and Rowe, Ref.6). There are 1 figure and 7 references, 2 of which are Slavic.

SUBMITTED: March 1, 1957.

AVAILABLE: Library of Congress

Card 1/1

KUCHAY, S.A.

Connection of a pulse transformer to a small active load.
Nauch.dokl.vys.shkoly; radiotekh. i elektron.no.1:222-231
' 58. (MIRA 12:1)

1. Nauchno-issledovatel'skiy institut komiteta po radioelek-
tronika.
(Oscillators, Electric)

(KUCHAY, S. A.)
 09-2-24/35
 AUTHORS: Kuchay, S. A., Rodin, A. M.
 TITLE: The Electric Absorption of a Gas by a Metal with a Diffusing Surface (Elektricheskoye pogloshcheniye gaza metallom s raspilyayushcheyaya poverkhnost'yu).
 PERIODICAL: Atomnaya Energiya, 1958, Nr 2, pp. 202-205 (USSR)
 ABSTRACT: When certain metals are bombarded with gas-ions whose energies are in the order of magnitude of some 10 eV, an accumulation of gas-molecules is noticed in the metal. This is e.g. used in isotopic separation of inert gases. When no chemical interaction between the gas and the metal starts, it is justified to assume that the gas-concentration is determined by its isotropic diffusion from the source which lies somewhat deeper than the range of the ions. From this follows that after a long irradiation the absorbed gas would have to be observed in all metal-layers in comparable concentrations and that the entire quantity of gas would only be determined by the thickness of plate. It was experimentally determined, however, that this is not the case, but that the entire gas accumulated in a layer, the thickness of which approximately corresponds to the range of ions. This contradiction can be removed by assuming that the

Card 1/2

The Electric Absorption of a Gas by a Metal with a Diffusing Surface.

19-2-2/35

"electric absorption" is connected with a cathodic evaporation from the metal surface. On this assumption the electric absorption is theoretically calculated, where for the sake of simplicity the following assumptions are made:

- a) The ionic range in the metals is the same for all ions.
- b) The thickness of the metal plate is great.
- c) The diffusion coefficient is not dependent on the coordinates and the concentrations.

At first the solution of the diffusion equation is given and then the following cases are treated in particular:

- a) Steady distribution
- b) Transition process in the source plane.
- c) Gas concentration

There are 3 figures, 8 references, 2 of which are Slavic.

SUBMITTED: August 30, 1957

AVAILABLE: Library of Congress.

Card 2/2

1. Gases-Absorption 2. Metals-Bombardment 3. Isotopes-Separation

57-28-3-10/53

AUTHOR: Kuchay, S. A.
 TITLE: Concerning the Problem of the Initial Stage of the Current
 Passage Through a Diode (K voprosu o nachal'noy stadii pro-
 khozhdeniya toka cherez diod)
 PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 3, pp.498-499
 (USSR)

ABSTRACT: The transit-time of the front electrons under the action of
 a constant voltage, applied pulse-like to cylindrical and
 spherical diodes is evaluated here. The ratio of the transit-
 time of the front-electrons t_a to the transit-time of the
 electrons in a vacuum in the absence of a space charge $-t_v$
 $\frac{t_a}{t_v}$ cannot exceed unity. At first the lower limit of this
 ratio is evaluated starting from simple considerations which
 also apply to cylindrical and spherical diodes. For flat
 cylindrical and spherical diodes with infinite emission

Card 1/2

57 20-3 10/33

Concerning the Problem of the Initial Stage of the Current Passage through
a Diode

1

$E_K < E_{\text{cath.}}$ applies. I. e. in the case of the same position of the electron-front x the actual field E_K acting upon the front-electrons is always less than the field $E_{\text{cath.}}$ at the cathode (in an assumed diode whose cathode moves together with the electrons sitting on its surface). Therefore in a model with movable cathode the period t will be greater than the transit-time t_v . Equations (2)ⁿ and (3) for the cylindrical diode with an anodic radius a and for a spherical diode with the same anodic radius, respectively, are written down. There are 2 figures, and 2 Soviet references.

SUBMITTED: April 18, 1957

1. Diodes--Electrical properties 2. Mathematics

Card 2/2

KUCHAY, S.A.

FIGURE 1. WORK INFORMATION NOV/5065

20(0) Zashchitnyye opredeli smeli, v. 3 (Artificial Earth Satellites, No. 3) Moscow, Izdatel'stvo MVD, 1979. 123 p. 9,500 copies printed.

Operating Agency: Kuchay, S.A. of Publishing House: L.V. Zhukovskiy, Tech.

Rep. No.: L.V. Zhukovskiy, M. of Publishing House: L.V. Zhukovskiy, Tech.

REMARKS: This collection of articles is the third in a series intended to disseminate data collected from artificial earth satellite investigations to scientists.

CONTENTS: The collection of articles deals with various problems arising in the operation of artificial satellites. The papers also present the use of artificial satellites as scientific instruments for various types of geophysical investigations.

1. Zhukovskiy, L.V. and V.I. Zhukovskiy. On Perturbations in the Orbit of Artificial Satellites Caused by the Resistance of the Air 29

2. Zhukovskiy, L.V. and V.I. Zhukovskiy. Observation of Artificial Satellites Using the Anticipation Method (Soviet satellites) 37

3. Zhukovskiy, L.V. and V.I. Zhukovskiy. On Perturbations in the Orbit of the Satellites of the Air 39

4. Zhukovskiy, L.V. and V.I. Zhukovskiy. Determination of the Density of the Atmosphere at an Altitude of 150 km by the Method of Satellite-Range Difference 46

5. Zhukovskiy, L.V. and V.I. Zhukovskiy. Methods of Preventing Interference Currents Arising at Contact of Layers of an Electromagnetic Resonator During Operation in a Combustive Medium 77

6. Zhukovskiy, L.V. and V.I. Zhukovskiy. A.I. Zhukovskiy, and V.I. Zhukovskiy. Some Results of Investigations of the Perturbations of the Atmosphere With the Aid of the Third Soviet Special 86

7. Zhukovskiy, L.V. and V.I. Zhukovskiy. Problem of Perturbations of Cosmic Rays 91

8. Zhukovskiy, L.V. and V.I. Zhukovskiy. Determination of the Density of the Atmosphere at an Altitude of 150 km by the Method of Satellite-Range Difference 96

9. Zhukovskiy, L.V. and V.I. Zhukovskiy. Methods of Preventing Interference Currents Arising at Contact of Layers of an Electromagnetic Resonator During Operation in a Combustive Medium 107

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40. Zhukovskiy, L.V. and V.I. Zhukovskiy. On the Problem of Interference of an Artificial Satellite and the Magnetic Field of the Earth 416

KUCHAY, S.A.

Errors of manometers caused by minor leaks in the shell of a
satellite. Isk. sput. zem. no.3:113-117 '59. (MIRA 12:12)
(Artificial satellites) (Manometer)

SOV/120-59-4-21/50

AUTHOR: Kuchay, S. A.

TITLE: Double Focussing of a Beam of Charged Particles in a Large Magnet Gap

PERIODICAL: Priory i tekhnika eksperimenta, 1959, Nr 4, pp 96-97 (USSR)

ABSTRACT: It is known (Refs 1-3) that the fringe field of a real magnet gives vertical focussing. However, when the magnet gap is small compared with the radius of curvature of the beam, Khurgin (Ref 1) showed that as far as the vertical effect on the beam is concerned, the boundary of a uniform field magnet is similar to a lens and $\Psi = \text{ctg } \epsilon$ (Fig 1). In a small gap the fringe field has very little effect on the horizontal focussing and in the first approximation one may assume that the uniform field abruptly stops on the boundary of the pole pieces. In this approximation the horizontal focussing condition is (Ref 4):

$$\rho \sin \Psi + \lambda \cos (\Psi - \epsilon) / \cos \epsilon = 0.$$
 The simultaneous solution of these two equations gives the following condition for double focussing:

$$\lambda / \rho = (-\Psi \sin \Psi) / (\Psi \cos \Psi + \sin \Psi).$$

Card 1/2 Thus, double focussing can be realized at least in a magnet

SOV/120-59-4-21/50

Double Focussing of a Beam of Charged Particles in a Large Magnet Gap

with a very small gap. However, in the case of a real magnet, the first approximation does not really hold and further calculations can only be carried out numerically. Fig 2 shows the vacuum chamber of a special model used in these numerical calculations (with the top lid off). In Fig 2, 3 represents the magnet. Numerical calculations show that double focussing is, in fact, possible even in a large gap. There are 3 figures and 5 references, of which 1 is Soviet, 1 German and 3 English.

SUBMITTED: July 16, 1958.

Card 2/2

82898

S/120/60/000/02/029/052
EO32/E414

24,2120

AUTHORS: Koval'skiy, G.A. and Kuchay, S.A.

TITLE: Investigation of Small-Scale Ion Pumps

PERIODICAL: Pribery i tekhnika eksperimenta, 1960, Nr 2,
pp 110-115 (USSR)

ABSTRACT: An important problem in vacuum technology is the development of high-vacuum pumps, in which the extraction of gas from the working volume is not accompanied by the back migration into this volume of the working fluid of the pump. Only one type of pump is known at present which satisfies this requirement. The pump is based on the removal of gas which is first ionized, with the aid of electric and magnetic fields. However, the ion pump described in the literature (Ref 1) has a length of about 4 m and consumes 42 kW, the pumping speed being approximately 5000 litres/sec. The problem therefore arises as to whether this particular design is the only possible one or whether other versions are possible, in particular those in which the energy consumption is lower and the linear dimensions are smaller. A series of experiments was carried out by the

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Investigation of Small-Scale Ion Pumps

authors in order to study the pumping action of a gas-discharge with a relatively short column in a magnetic field. These experiments did not lead to the development of the working model but nevertheless the results obtained are of definite interest and are now reported. Fig 2 shows the pumping system employed. The experiments were carried out on two installations in which the high-vacuum part of the discharge column was 5 cm long (apparatus A) and 12 cm long (apparatus B). Both A and B had identical vacuum systems and differed only in the design of the cathode. In A the cathode was directly heated and was in the form of a flat spiral, while in B the cathode was in the form of a rectangular plane surface, heated by electron bombardment. The cross-sections of the channels between the fore-vacuum and the high-vacuum regions were circular in A and rectangular in B. The discharge current was varied between 0 and 3A, the voltage between 100 and 500 V and the magnets produced a field of 2500 Oe in A and 5000 Oe in B. Pumping speeds between 14 and 46 litre/sec were obtained

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Investigation of Small-Scale Ion Pumps

for model B with fore-vacuum to high-vacuum pressure ratio between 14.5 and 5.5 respectively. The pumping speed achieved with model A was 1.7 litre/sec with the fore-vacuum to high-vacuum pressure ratio of 3.5. It was found that the pumping characteristics are improved when the magnetic field is increased. It was also found that there is an optimum discharge current at constant voltage (Fig 7). It was noted that an increase in the voltage across the discharge always improves the pumping characteristics. It is concluded that it is definitely possible to produce small-scale ion pumps working with a pressure drop of about 100. There are 7 figures and 1 English reference. 4

SUBMITTED: February 26, 1959

Card 3/3

16.7800,24.2000,24.6700

77300
SOV/57-30-2-3/18

AUTHOR: Kuchay, S. A.

TITLE: Optical Properties of Axially Symmetrical Magnetic Fields With a Central Source of Charged Particles

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol 30, Nr 2, pp 142-152 (USSR)

ABSTRACT: Axially symmetrical magnetic fields are often used for magnetic focusing or for mass analysis of charged particles. The most used fields are those with mirror symmetry:

$$H_z(r, z) = -H_z(r, -z),$$

$$H_r(r, z) = H_r(r, -z).$$

where the field components are in the cylindrical coordinate system. The author denotes trajectories lying in the central plane $z = 0$ as plane trajectories. In a given field $H(r, 0)$ particles with same value of the parameter $[H \rho] = pc/e$

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Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
Charged Particles

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have a plane stationary orbit $r = r_0$ if the condition:

$$H(r_0)r_0 = [H]$$

holds on the circle of $r = r_0$, $z = 0$. The author limits his inquiry to fields containing only one stationary orbit and only to fields with a source central with respect to the stationary orbit. The latter are called circular fields. Shpinel' pointed out (DAN SSSR, 53, 801, 1946) that there exist nonuniform fields in which a particle with a critical value of $[H \rho]_{ac}$ describes a spiral trajectory approaching the stationary orbit asymptotically from the inside, while the particles with $[H \rho] > [H \rho]_{ac}$ cross the orbit under a finite angle and never return to it. Such fields are, therefore, called fields with a cutoff. In a

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Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
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later paper Shpinel' (ZhTF, XX, 834-846, 1950)
computed the plane trajectories and described a

β -spectrometer with counters on the stationary
orbit. In 1953 Korobochkin noticed that the field
with a cutoff can be represented as a limiting case
of a more general relationship between the radial
distribution of the circular field and its optical
properties. In the present paper the author gives
an interpretation of the equations of motions in
axially symmetrical fields, describes their optical
properties in the central plane, and the spacial
motion in circular fields. He shows the way for
using the circular fields as a mass-separating device
with a source extended along the Z axis. The field
can be represented by means of the vector potential
 $A = A_z$, given by:

$$A(r, z) = \frac{1}{r} \int_0^r H(\xi, z) \xi d\xi. \quad (2)$$

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Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
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whenever the transition to the limit $r_1 \rightarrow 0$ is possible. The author writes the equations of motions as:

$$m\ddot{r} = -\frac{d}{dr} \psi(r, z) \quad | \quad r = r, \quad z,$$

where

$$\psi(r, z) = \frac{p^2}{2m} \left\{ 1 - \left[\frac{A}{H\phi} - \frac{r_0}{r} \left(\frac{A_0}{H\phi} - \cos \alpha_0 \right) \right]^2 \right\},$$

where α_0 = angle between the initial velocity and the $r = r_0$ parallel; $z = z_0$, passing through the origin. The function ψ corresponds to the kinetic energy of the meridional motion of the particle, while the cosine of the angle between the velocity at a given point and the parallel through that same point is given by:

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Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
Charged Particles

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$$t = \frac{A}{[H]} - \frac{z}{r} \left[\frac{A_0}{[H_0]} - \cos \alpha_0 \right] \quad (3)$$

At this point the author introduces the concept of the nonhomogeneity index k given by:

$$k = \lim_{\alpha, \beta \rightarrow 0} \frac{\sin \alpha}{\sin \beta} = \frac{r_r}{r_r - r_r}. \quad (6)$$

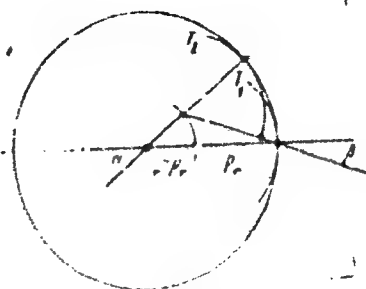
The quantities used are shown in Fig. 2. The index depends not only on the field distribution but also on the value of the $[H \rho]$ parameter, since the field has, in general, different optical properties for beams of various impulses. For a uniform field k has the limiting value of 1. The author develops equations for the field at the point of return r_r , the value of $(d \xi / dr)_{r=r_r}$, and the azimuth of the point of return ϑ_r . Using the

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Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
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Fig. 2. Determination
of nonhomogeneity
index k . T_1, T_2 are
arcs of trajectories
with same H near
point of turn.



parameter $\mu = r/r_r$ he discusses the function
 $\xi(\mu)$ and plots some examples. He shows that
the case $\rho_r = r_r$ corresponds to the case when the
trajectory approaches r_r asymptotically, and one is
dealing with a field with a cutoff. In this case

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Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
Charged Particles

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$1/k \rightarrow 0$, and this is then the other limit of the k values. Next, the author derives a formula for the aberration:

$$\Delta_r = \frac{r_r^2}{2k}.$$

and for the linear magnification gives an approximate expression:

$$\Delta_r = k r_r. \quad (17)$$

All symbols used are shown geometrically on Fig. 6. Finally, the mass dispersion is given by:

$$\Delta_m = \frac{k r_r}{2} \frac{t_m}{m},$$

It follows that for a given k all focusing properties of the central plane can be expressed directly using

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Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
Charged Particles

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307/57-30-2-3/10

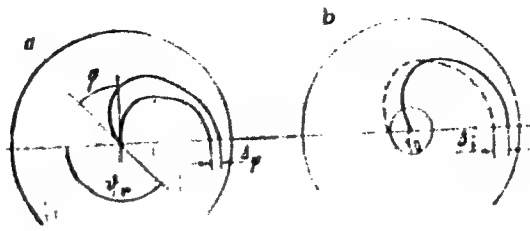


Fig. 6. Symbols used in equations of optical properties in the central plane.

the nonhomogeneity index. The collectors of isotopes located at $\vartheta = \vartheta_r$ must have a clearance given by:

$$s = \Delta_m - \Delta_i - \Delta_v = kr_r \left(\frac{1}{2} \frac{t_m}{m} - \frac{r_0}{r_r} - \frac{1}{2k^2} \varphi^2 \right).$$

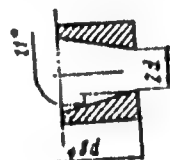
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Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
Charged Particles

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One sees that separation capabilities of circular waves increase with increasing k . The author nevertheless points out that this simple picture is true only for the central plane. Other noncentral trajectories with impulses close to the critical oscillate around the central plane but cross it comparatively far from $r = r_p$. This makes difficult the use of circular field for separation purposes. To investigate the matter further, the author computed numerically some trajectories for the case of finite-sized sources. He shows the field due to pole on Fig. 5 (only right side of fig. shown).

Fig. 5. Pole shape
of the model.

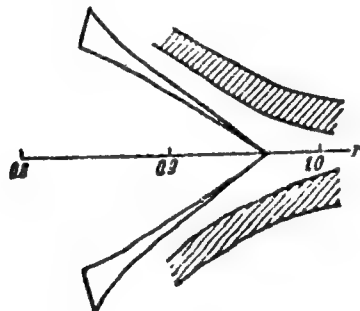


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Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
Charged Particles

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He shows on Fig. 9 the form of the trajectory pro-
jection "lines" for an infinitely thin source and
a collector at $r = 2$, the angular dispersion
of the beam being $\varphi = \pm 10^\circ$.



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Caption to Fig. 9 on Card 11/12

Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
Charged Particles

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Fig. 9. Shape of lines of a cutoff field. Infinitely thin source is $0.2r_r$ high. The collector is a meridional plane with an azimuth $\alpha_r = 2$. Cross-hatched region is part of the heavy isotope "line" with $\delta_{\pi}/m = 10\%$. On the r -axis are divisions in r_r units.

Poor separation properties of the fields with a cutoff are due to the sharp rise of vertical forces near the point of turning back. This may be avoided by computing the field and the operating values of

[$h\rho$] in such a way that the separation takes place for smaller values of k . Although this reduces the clearance in the central plane, one gets a general improvement in the picture. The author believes that circular fields can be used for mass separation in the case of divergent beams. In

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Optical Properties of Axially Symmetrical
Magnetic Fields With a Central Source of
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view of their considerable dispersive power, one does not have to care about the removal of aberration, about the reduction of the unavoidable divergence of the beam, or the ultimate dimension of the source. There are 11 figures; and 8 references, 2 Soviet, 2 Japanese, 2 German, 1 U.K., 1 U.S. The U.K. and U.S. references are: E. Rae, Phil. Mag., 41, 525-533, 1950; N. Coggeshall, M. Muskat, Phys. Rev., 66, 187, 1944.

SUBMITTED:

November 14, 1958

Card 12/12

KUCHAYEV, V.L.

USSR/Electronics - Electrical effects

Card 1/1 Pub. 86 - 12/36

Authors : Kovriashnykh, O. M., and Kuchayev, V. L.

Title : Radioactive sources of high voltage

Periodical : Priroda 44/6, 86 - 89, Jun 1955

Abstract : An apparatus is described which consists basically of two plates, one grounded and the other ideally insulated and coated with a radioactive substance, the whole being placed in a vacuum. The principle on which a potential difference is developed is explained, such difference amounting in a given instance to 6,600 volts. Figures of quantities involved are stated. Five English-language references (1913-1953). Drawings; graphs.

Institution : *INST. Physical Problems, im V.I. Vavilov, Acad Sci USSR*

Submitted :

AUTHORS: Boraskov, G. K., Kuchajev, V. L. 20 119-2-31/60

TITLE: The Catalytic Activity of Germanium in Relation to the Isotopic Exchange Reaction Between Hydrogen and Deuterium (Kataliticheskaya aktivnost' germaniya v otnoshenii reaktsii izotopnogo obmena vodoroda s deuteriyem)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr. 2, pp. 302-304 (USSR)

ABSTRACT: The present paper compares the specific catalytic activity of a germanium semiconductor element with the activity of the transition metals having incompletely filled d-zones. This comparison is here made with respect to the reaction of isotopic exchange of hydrogen with deuterium. The authors investigated the catalytic activity of germanium by means of the static method with circulation. The content of HD in the hydrogen-deuterium mixture was determined by means of the method of thermal conductivity. The reaction took place in a reaction vessel of quartz within the temperature interval 330° - 550°C, the equimolar

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mixture of hydrogen with deuterium having had a pressure of 90 - 190 mm torr. Monocrystalline germanium with an electronic line of the resistance 6 Ohm.cm served as catalyst. The gases hydrogen and deuterium used for reaction were produced electrolytically. The formula used for the calculation of the specific catalytic activity of germanium is given; it is valid for random mechanisms of the exchange of hydrogen and deuterium. A diagram shows the dependence of the catalytic activity of the two investigated germanium samples on the inverse temperature. The activation energy of the reaction amounted to 17 kcal/g-mol. The specific catalytic activity of the two germanium samples amounted to $330^{\circ} \sim 3 \cdot 10^{-10}$ g-mol/cm².sec. The catalytic activity of the samples determined at 650°C was a little greater. The reaction order was investigated with one of the two germanium samples at 480°C. The same degree of transformation at various pressures shows that the reaction takes place

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according to the first order. A table contains the specific catalytic activities of germanium and of some metals in relation to the reaction of the oxygen-deuterium exchange at 300°C and at a pressure of the mixture of 40 torr. In the experiments discussed here the exchange takes place according to the absorption-desorption mechanism when the surface of germanium is only little filled and when the absorption is the limiting stage of reaction. In the transition to a stronger filling of the germanium surface the activation energy of the reaction must obviously increase and approach the desorption energy of hydrogen (about 41 kcal/g-mol). The catalytic activity of the metals of period IV increases with growing atomic number and reaches a maximum with nickel. The catalytic activity decreases strongly in the transition from nickel to copper. There are 1 figure, 2 tables and 2 references, 1 of which is Soviet.

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The Catalytic Activity of Germanium in Relation to the Isotopic Exchange Reaction Between Hydrogen and Deuterium 20-119-2-31/60

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-Chemical Scientific Research Institute imeni L. Ya. Karpov)

PRESENTED: October 9, 1957, by A. A. Balandin, Member, Academy of Sciences USSR

SUBMITTED: October 1, 1957

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S/195/60/001/003/004/013
B013/B058

AUTHORS: Kuchayev, V. L., Boreskov, G. K.

TITLE: Isotopic Exchange of Hydrogen on Germanium Samples of
the n- and p-Type

PERIODICAL: Kinetika i kataliz, 1960, Vol. 1, No. 3, pp. 356 - 364

TEXT: In this paper the authors studied the effect of semiconductor properties of crystalline germanium on its catalytic activity with respect to the isotopic exchange of hydrogen with deuterium and the chemisorption of hydrogen, on germanium samples. Hydrogen and deuterium were produced by electrolysis. Germanium monocrystals crushed in vacuum, from which 5 samples with various resistivity and various type of conductivity were prepared, served as catalysts. The catalyst surfaces were measured directly in the reaction vessel after the adsorption of spectrally pure krypton at the temperature of liquid nitrogen. The calculation was made according to the BET method. The relative measuring accuracy amounted to about 5%. ✓

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Table 2 shows the change of the germanium-sample surfaces under the influence of various temperatures. The catalytic activity of germanium with respect to isotopic exchange in homomolecular hydrogen was studied by the static method at pressures of the equimolecular hydrogen-deuterium mixture of 0.7 and 0.1 mm Hg at from 180 to 280°C. The calculation method was described in the paper by M. A. Avdeyenko, G. K. Borekov, and M. G. Slin'ko (Ref. 9). No noticeable difference in the catalytic activity was ascertained between samples of different type of conductivity. The rate of adsorption of hydrogen was studied at room temperature (Table 3) and at 100°C before testing the catalytic activity. It was determined that rates of adsorption, energy of activation, and the adsorption as a function of the surface occupation are almost similar for all 4 samples. The adsorption isotherms of hydrogen were recorded at 210°, 244°, and 274°C and don't show any noticeable differences. With an occupation of up to $\theta = 0.15$, they correspond to Langmuir's equation for adsorption with dissociation. The heat of adsorption is 25 kcal/mole. A deviation from Langmuir's equation and a lower heat of adsorption are to be observed at

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a higher degree of occupation. The solubility of hydrogen in germanium is small and of no effect on the measuring results. As can be seen from the dependence of the rate of desorption on the surface occupation at 180°C (Fig. 10), it drops to one third after removal of about 20% of the adsorbed hydrogen from the germanium surface. It was established that the rate of desorption of the hydrogen-deuterium mixture is about 1.5 times greater than the rate of isotopic exchange, and about 1.5 times smaller than the rate of desorption of hydrogen, under equal conditions. The studies gave the following conclusive results: The rates of hydrogen adsorption and isotopic exchange were almost equal for all samples studied in spite of a change of the concentration of free electrons and holes by 7 to 9 orders of magnitude. This permits the conclusion that the adsorption of hydrogen on germanium proceeds without participation of free electrons or holes, i. e. without surface charge. Similar rates of desorption and isotopic exchange point towards an adsorption-desorption mechanism of the reaction. V. M. Frolov, O. V. Krylov, and S. Z. Roginskiy are mentioned. There are 10 figures, 3 tables, and 18 references: 5 Soviet, 10 US, 1 Dutch, and 3 German. ✓

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Samples of the n- and p-Type

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ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova
(Physicochemical Institute imeni L. Ya. Karpov)

SUBMITTED: June 27, 1960

Таблица 2

Поверхность образцов германия, см²

1 Номер образца	2) Предварительная температурная обработка при			
	100°	300°	500°	630°
1	2,3	1,9	1,4	1,3°
2	2,0	1,6°	—	—
3	1,8	1,5°	1,1°	—
4	2,1°	1,8°	—	—
5	—	—	0,05	—

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Таблица 3


Удельные скорости адсорбции H_2
на образцах германия
(Энергия активации адсорбции
 $6 \pm 0,5$ ккал/моль)

а) Номер образца	б) Температура, °C	в) $\frac{1}{T} \frac{d \ln}{dt} 10^4$, моль/см ² ·сек·мм рт.ст.
1	18	4,0
2	24	4,0
3	22	3,7
4	22	2,9

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Legend to Table 2: The surface of the Ge samples, cm^2 . a) No. of the sample; b) heat treatment at:

Legend to Table 3: The specific rate of adsorption of H_2 on Ge samples (energy of activation 6 ± 0.5 kcal/mole) a) No. of the sample; b) temperature, $^{\circ}\text{C}$; c) $(1/P_0) (dn/dt) \cdot 10^{14}$, mole/ $\text{cm}^2 \cdot \text{sec. mm Hg}$

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KUCHAYEV, V.L.; BORESKOV, G.K.

Relationship between the catalytic activity and semiconductor
properties of germanium. Probl. kin. i kat. 10:108-110 '60.
(MIRA 14:5)

1. Fiziko-khimicheskiy institut imeni L.Ya. Karpova.
(Germanium)

S/020/62/145/004/022/024
B101/B138

AUTHORS:

Kuchayev, V. L., and Boreskov, G. K., Corresponding Member
AS USSR

TITLE:

Catalysis and adsorption of hydrogen on germanium films

PERIODICAL:

Akademiya nauk SSSR, Doklady, v. 145, no. 4, 1962, 853-856

TEXT: The authors tested the data of Y. L. Sandler, M. Gazith (J. Phys. Chem., 63, 1095 (1959)) on the catalytic activity of sputtered Ge films. Special devices (Fig. 1) prevented contact between the Ge and the tungsten wire coil and eliminated its catalytic effect by immersion in liquid Ga. The ampoule was heated to 450°C and evacuated to 3·10⁻⁷ mm Hg, before sputtering on the Ge. This was done by passing a current (13.5 a) through the W coil, with the ampoule immersed in liquid nitrogen. Catalytic activity and rate of H₂ adsorption were measured according to Kinetika i kataliz, 1, no. 3, 356 (1960). Results: (1) The specific rate of H₂ adsorption was (29 - 56)·10⁻¹⁴ mole/cm²·sec·mm Hg. (2) The catalytic activity of H - D exchange at 100°C was less than 1·10⁻¹⁵ mole/cm²·sec.

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(1) iron
immersing the W coil
the W coil; (5) copper wire
moving air bubbles from (3).

Catalysis and adsorption of ...

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i.e., in agreement with K. Tamaru, M. Boudart (Adv. in Cat., 9, 699 (1957)) and five times less than the values of Sandler and Gazith. This is attributed to the fact that these scientists had not eliminated the catalytic activity of the W coil. There are 3 figures and 1 table. ✓

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova
(Physicochemical Institute imeni L. Ya. Karpov)

SUBMITTED: April 29, 1962

Fig. 1. (A) Reaction vessel for studying the rate of H_2 adsorption on Ge films. (1) ampoule; (2) Mo lead-in, 3.5 mm diam; (3) coil of 0.5 mm W wire; (4) graphite crucible; (5) glass tube; (6) ~0.1 g Ge; (7) iron wire which is removed with a magnet. (B) Device for immersing the W coil in liquid Ga. (1) ampoule; (2) iron bar with which the test tube (3) containing liquid Ga (4) is raised toward the W coil; (5) copper wire for fixing the device in raised position; (6) glass rod operated by iron bar (7) sealed in glass, for removing air bubbles from (3).

Card 2/8 Z

ACHILOVA, G.; KUCHAYEVA, A.

Distribution of actinorhizal-antagonists to the causative
agents of cotton diseases in Gherzon soils of Uzbekistan.
Uzb. biol. zhur. 9 no.1:19-22 '65. (MIRA 18:6)

1. Institut botaniki AN U.S.S.R.

KRASILNIKOV, N.A., KUCHAYEVA, A.G., NIKITINA, N.I. and SKRYABIN, G.K.

"Microbes - Antagonists in Plant Diseases," a paper presented at the Antibiotics
Research Conf., Peiping, 1-6 December 1955

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KUCHAYEVA, A.G.; YEGOROVA, S.A.

Penetration of antibiotics into perennial plants. Mikrobiologiya
24 no.3:315-320 My-Je '55. (MIRA 8:7)

1. Institut mikrobiologii Akademii nauk SSSR, Moskva.
(ANTIBIOTICS, effects,
on plants, penetration in perennial plants)
(PLANTS, effect of drugs on,
antibiotics, penetration in perennial plants)

KUCHAYEVA, A. G.

Intake and distribution of antibiotics in plants with extra-radical introduction of antibiotics. N. A. Kravtsov, A. G. Kuchayeva, R. O. Mirzabekyan, and N. I. Nikitina. Doklady Akad. Nauk S.S.S.R. 102, 373-375 (1955). - Penicillin 62
 lin introduced into the trunk of the plant by Shevyrev's method is rapidly absorbed by cherry, apple, peach, and apricot trees and slowly absorbed by maple, linden, and ash. The actively participating plants generally display a rapid and complete distribution of the drug throughout the tree, including the leaves; the weakly active plants do not show the drug in the leaves at all. Lowered temp. and high humidity and moisture level tend to retard the intake of the antibiotic. Streptomycin, globisporin, Antracycline, syn-thomycin, and griseofulvin showed similar characteristics. The antibiotics introduced through a hole in the trunk are distributed throughout the foliage and not sectorally as to site of introduction. G. M. Kozlovskiy

KUCHAYEVA, A.G., kandidat biologicheskikh nauk.

Antibiotics as a means for the prevention of mildew in grapes.
Vest.AN SSSR 26 no.12:53-54 D '56. (MIRA 10:1)
(Antibiotics) (Mildew)